Little River Watershed Restoration Initiative

Name of the watershed: Little River Watershed

8-digit Hydrological Unit Code: 06010201

Impaired waters included on Tennessee's 2004 303(d) list: Brown Creek, Caney Branch, Casteel Branch, Crooked Creek, Ellejoy Creek, Flag Branch, Grandview Branch, Gun Hollow Branch, High Bluff Branch, Hollybrook Branch, Laurel Bank Branch, Little Ellejoy Creek, Little River, McCall Branch, Nails Creek, Peppermint Branch, Pistol Creek, Pitner Creek, Rocky Branch, Roddy Branch, Russell Branch, S. Fork Crooked Creek, S. Fork Ellejoy Creek, Short Creek, Spicewood Branch, Springfield Creek, Stock Creek, Tipton Branch, Twin Branch, and Wildwood Branch

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ABSTRACT

The Little River, located in southeast Tennessee, supports several state and federally protected species, is heavily used for recreational purposes, and provides drinking water to local communities. Several Little River tributaries are classified as impaired, primarily due to bacteria, sediment, and habitat alteration. Eighteen miles of the Little River are threatened due to a documented decline in diversity.

The Blount County Soil Conservation District is requesting Targeted Watershed Grant Program funding to assist Little River Water Quality Forum partners in implementing stakeholder-identified strategies to reduce bacteria and sediment loads in priority areas. Funds would be used to address nonpoint source pollution from agricultural and residential areas and assist low-income households repair failing septic systems. This proposal sets measurable short-term goals, and includes a monitoring component to document progress. Upon completion of this three-year initiative, restoration priorities and strategies would be reevaluated as part of a long-term adaptive management strategy.

PROJECT DESCRIPTION

Introduction

The Little River originates in the Great Smoky Mountains National Park. The river's water quality within the park is excellent. Downstream of the Park, the river is impacted by agricultural and development practices, urban runoff, and failing septic tanks. The quality of the river slowly degrades with increasing distance from the Park. The Tennessee Department of Environment and Conservation (TDEC) has classified 230 stream miles as impaired [2004 303(d) report]. Bacteria, sediment, and habitat alteration are the primary causes of impairment; impacting 65%, 56%, and 34% of 303(d) listed stream segments respectively. Agricultural and residential runoff are the dominant pollution sources. Rapid residential and commercial development threatens to further deteriorate the quality of the Little River. TDEC has classified 18 miles of the Little River as threatened due to a documented decline in diversity.

This river supports several state and federally protected species [including the endangered duskytail darter (federal and state listed) and fine-rayed pigtoe mussel (state listed); and the threatened snail darter (federal and state listed) and longhead darter (state listed)]. The River is heavily used for recreational purposes. It also provides drinking water to thousands of residents in Blount County and is viewed by most county residents as a valuable resource.

In response to concerns about deteriorating water quality, local, state, and federal agencies as well as private organizations and a state university are working together to improve and protect water quality in the Little River. These efforts are being coordinated through the Little River Water Quality Forum (LRWQF). LRWQF, a partnership of 19 agencies and organizations, was formed in 1997 to plan and coordinate water quality improvement and protection initiatives. Little River Watershed Association (LRWA), a citizen based non-profit

organization dedicated to the protection and improvement of the Little River, works closely with other LRWQF members.

LRWQF's goal is to restore all impaired stream reaches, remove them from the 303(d) list, and prevent additional reaches from becoming impaired. Significant progress has been made in the areas of educating citizens, assessing conditions, identifying pollution sources, and implementing water quality improvement projects. Draft TMDLs for bacteria and siltation/habitat alteration provide preliminary pollution reduction goals. A detailed geographic watershed database and pollution load model has been developed as planning tools to evaluate restoration options and strategies and target pollution reduction efforts.

Attainment of long-term goals requires a comprehensive plan that has community buy-in and support. Citizen input has been a key component of local planning efforts. In 1997, the Blount County Planning Department conducted two series of 17 public input workshops. Water quality was identified as a priority issue. The 2003 Blount County Water Quality Plan as well as Maryville and Alcoa stormwater plans were developed with broad citizen participation. Little River, Big Future (a participatory planning process funded in part by a 606(b) grant) recently built on these efforts and engaged stakeholders in development of a citizen-generated plan with specific restoration and protection strategies. Through this proposal, The Blount County Soil Conservation District (BCSCD) is requesting Targeted Watershed Grant Program (TWGP) funding to assist LRWQF partners in implementing stakeholder-identified strategies to improve and protect water quality in the Little River Watershed.

Description of the Proposed Projects

TWGP funding would be used to implement a three-year initiative to reduce bacterial, sediment, and habitat alteration impacts to the Little River watershed. These pollutants are the primary sources of impairments listed in the 2004 303(d) list and pose the greatest threats to human and ecological health. Priority areas include Ellejoy, Crooked, Nails, and Pistol Creeks and the Little River between Perry's Mill and Highway 33. The pollution load model estimated that Ellejoy, Crooked, Nails, and Pistol Creek watersheds account for over 50% of total suspended solids, total nitrogen, and total phosphorus loading in the Little River Watershed. The Little River between Perry's Mill and Highway 33 is a priority area because it provides municipal water to most of Blount County, provides habitat to several state and federal protected species, and is heavily used for recreational purposes.

TWGP funding would enable LRWQF partners to implement an agricultural cost-share program, develop a homeowner educational campaign, initiate a septic system maintenance and repair cost-share program, and monitor conditions to document progress.

Agricultural Best Management Practices: The pollution model estimated that agricultural runoff is the primary pollution source impacting the Little River. TWGP funds would provide cost-share funding to enable farmers to install conservation practices, including rotational grazing systems, livestock exclusion, alternative watering sources, and riparian buffers that will reduce bacteria and sediment loads. The BCSCD and the Natural Resources Conservation Service would provide a wide variety of assistance, including one-on-one discussions, demonstrations, farm plans, drawings and plans, implementation instructions, and oversight.

During the first three months of this initiative, partners would inform producers about the availability of cost share funding through direct mailing to 1,300 landowners, press releases to

local newspapers, and one-on-one contacts. Throughout the initiative, pasture walks (at least four per year), annual awards banquets, a model farm tour, and watershed fact sheets would be used to promote use of use of agricultural Best Management Practices (BMPs). These outreach activities would cost about $8,000 (Table 1 categories 4 a, c, and e).

Associated BMPs would be scheduled according to the following timetable in order to meet the expected goals of the TWGP grant:

- *Year one* – 2 miles of livestock exclusion fencing with associated riparian habitat would be installed. 1200 acres of pastureland will be renovated in accordance with a prescribed grazing system, which will include alternative watering systems, and heavy use areas. Cost of year one projects has been estimated at $150,000 (Table 1 categories 4 a, c, e, and f).
- *Year two* – 3 miles of livestock exclusion fencing, 30 acres of native warm season grass establishment, and 1800 acres of pasture renovation. Costs of year two projects has been estimated at $225,000 (Table 1 categories 4 a, c, e, and f).
- *Year three* – 3 miles of livestock exclusion fencing, 30 acres of native warm season grass establishment, and 1800 acres of pasture renovation. Costs of year three projects has been estimated at $225,000 (Table 1 categories 4 a, c, e, and f).

Matching funds from over 60 participating landowners would meet the 25% requirement for Agricultural BMPs. Furthermore, leveraged funds from U. S. Fish and Wildlife Service, Tennessee Department of Agriculture, Tennessee Valley Authority, Environmental Quality Incentive Program, Wildlife Habitat Incentive Program, and the Grasslands Reserve Program are expected to equal $500,000 over the three year term.

<u>Homeowner outreach program:</u> Pollution load modeling found that runoff from residential areas is the second leading source of pollution in the Little River Watershed. As the

area develops, the pollution loads from residential areas will increase. TWGP funding would enable partners to development a residential homeowner educational campaign. The goal of this campaign is to enhance homeowner understanding about how their land management practices can impact water quality, and encourage them to adopt management practices that minimize impacts. The Blount County Extension Service would lead this effort. The program would focus on maintenance of septic systems, restoration and stewardship of wetlands and riparian buffers, management of pet waste, lawn care and other sources of pollution from residential areas.

The schedule and milestones for this project would include:

- *Within Six Months* – Outreach materials would be obtained at a cost of $30,000 (Table 1 categories 3 a and e).
- *Within Nine Months* – Train-the-Trainer workshops would be held in conjunction with the Master Gardener Program. Three workshops would be held with the goal of training 150 Master Gardeners, who would assist with community workshops and provide one-on-one assistance to homeowners. Costs of this activity would be $22,500 (Table 1 categories 3 a, c, e, f, and h).
- *Year one – A* small wetland and riparian plant arboretum with signage and an educational brochure would be developed at a cost of $6,000 (Table 1 categories 3 a, and e).
- *Year two and three* – Two subdivisions within each priority area would be selected based on lawn care practices and conditions of stream banks and riparian buffers. Workshops would be held for residents of each selected subdivision. Two additional workshops would be held for land owners outside the selected subdivisions. Native riparian or wetland

seedlings would be provided to landowners with riparian or wetland property. Costs of these activities are estimated at $8,000 (Table 1 categories 3 a, c, e, and h).

Septic system maintenance and repair cost-share program: Approximately 2,100 suspect septic systems have been identified from low-elevation color infrared photography of the Little River Watershed. Many of these suspect systems belong to low-income families who are financially unable to repair them. Partners propose to use $150,000 of TWGP funding to assist low-income households with repair of failing septic systems (Table 1 categories 2 a, c, e, and f). During year one, cost share criteria would be developed. An average of 25 systems would be repaired each year.

Concurrent Projects: The above activities would address the primary current sources of pollution impacting this watershed. In addition to these projects, LRWQF partners would be laying the foundation for a long-term effort to manage development impacts to water quality. These efforts would including: review and update local codes and ordinances; low impact development; decentralized wastewater, and advanced stormwater workshops and demonstrations; and development of a comprehensive GIS tool to aid in planning decentralized wastewater management and other best practices tool (based on characteristics such as soils, slope, and distance from streams). These concurrent projects will not rely on TWGP funding.

Monitoring and Evaluation: The success of this initiative will ultimately be determined by post-initiative bacteria and sediment load reductions in priority sections of the watershed. Pre-project bacteriological assessment of the Little River and its tributaries were conducted 1996-1998 and again in 2003-2004. Assessment sites included 6 sites on the main channel of the Little River and sites near the mouth of the 9 largest tributaries. Additional samples were collected between 2003 and 2005 in each priority tributary watershed, with four to eight sites

being sampled over a one year period. TDEC has recently developed a draft TMDL for pathogens in the Little River watershed. Impaired sections of the Little River watershed will require 17% to 96% load reductions.

LRWQF partners will collaborate with TDEC to collect post-implementation bacteria samples in 2008. This initiative will be considered successful if post-initiative assessments document the following conditions: bacteriological standards are met at all main channel Little River sites, geometric mean bacteria concentrations are reduced by an average of 30% in priority tributary watersheds, and conditions improve sufficiently in at least one tributary that it can be removed from the 303(d) list.

Stormwater total suspended solids (TSS) and turbidity samples will provide environmental indicators to measure success in reducing sediment loads. Stormwater TSS and turbidity samples were collected using single-stage samplers at 20 sites throughout the watershed in 2003-2004. TSS concentrations were highest in the four priority tributary watersheds. Post-initiative stormwater TSS samples will be collected in 2008. This initiative will be considered successful if TSS concentrations and turbidity levels are reduced by an average of 25% in priority tributaries.

Daily turbidity samples between 1990 and 2004 are available from the Maryville water treatment plant. High flow (0% to 10% daily flow exceedance*)* turbidity levels have nearly doubled since 2000 compared with levels observed in the 1990s. Our long-term goal is to reduce turbidity to levels equal to or less than those observed in the 1990s. Short-term goals include better defining the TSS and turbidly sources and reducing high flow turbidity by at least 20% at the Maryville water treatment plant. This initiative will be considered successful if short-term goals are achieved by 2009.

In order to further define bacteria and sediment pollution sources, target restoration efforts, and convince land owners to implement BMPs, the following monitoring and evaluation would be conducted in 2006:

- Bacterial source analysis will identify the origin of fecal contamination (cattle, human, horses, and wildlife) at priority sites at a cost of $25,000 (Table 1 categories 3a and f).
- At least four stormwater samplers will be installed in each priority tributary watershed. Sediment particle size and biological community samples will be compiled or collected from at least 15 sites. Analysis of this information along with comparison to samples from ecoregion reference sites will aid in refining long-term sediment reduction goals. This activity would cost $34,000 (Table 1 categories 3 a, e, and f).
- Volunteers will be trained and assist with subwatershed reconnaissance to evaluate riparian and streambank conditions and identify pollution sources and restoration opportunities (such as failing septic systems and critically eroding streambanks) in priority areas. . This activity would cost $21,000 (Table 1 categories 3a, e, and f).
- High resolution multi-spectral satellite imagery will be obtained and evaluated as a low-cost tool to update the watershed geographic database in this rapidly developing watershed. The database was developed from manual interpretation of color infrared photography obtained on February 21, 2000. This activity would cost $40,000 (Table 1 categories 3a and e).

LRQWF partners have strived to engage a broad group of federal, state, and local agencies in planning and implementing efforts to improve and protect the Little River and to coordinate efforts with EPA, federal and state water quality programs. Funds from a variety of state and federal programs, including the Nonpoint Source Program, have enabled partners to

implement agricultural BMPs in the Ellejoy Creek watershed, install a Septic Tank Effluent Pump system to solve the failing drain field problem in a subdivision located along Crooked Creek, develop a watershed GIS database and pollution load model, assess the Short Creek watershed, and serve as the pilot community for the Tennessee Growth Readiness Program. Little River, Big Future, a participatory watershed planning process, was made possible by Water Quality Management Planning funding. Partners collaborate with TDEC in assessing water resource conditions, interpreting results, planning restoration, and co-sponsoring TDEC's watershed management plan public meetings.

LRWQF activities benefit fish and wildlife managed by the U. S. Fish and Wildlife Service (USFWS) and the Tennessee Wildlife Resources Agency (TWRA). The endangered duskytail darter has recently been introduced to a section of the Little River where it had not previously been found. Both USFWS and TWRA have participated in LRWQF activities and provide cost-share funding to assist farmers in this watershed with BMP installation.

Attainment of pollution reduction goals required by the draft bacteria and siltation/habitat alteration TMDLs will require long-term commitment and a strategy based on stakeholder involvement, collaboration and adaptive management. TWGP funds would enable partners to implement a three-year initiative with short term goals of significantly reducing bacteria and sediment loads in priority sections of the watershed. Upon completion of this initiative, conditions will be monitored, progress towards attaining goals will be evaluated, new information will be evaluated, and restoration priorities and strategies will be reevaluated and adapted.

DESCRIPTION OF OUTREACH ACTIVITIES

Outreach activities to encourage agricultural and residential property owner participation are described above. Since 1998, LRWQF partners have informed watershed stakeholders about conditions, impacts, and possible solutions. Outreach activities would continue during this initiative with emphasis on informing stakeholders about the availability of TWPG funding, pollution reduction strategies, goals, and progress in implementing components. Media outlets will be used during month one to inform residents about TWGP opportunities. Within three months, a brochure will be developed, and a stakeholder meeting will be held. Other outreach activities will include a bi-annual newsletter, annual stakeholder meetings, and internet site. These outreach activities will cost $30,000 (Table 1 categories 3 a, c, f, and h).

The BCSCD has taken a proactive approach to environmental stewardship using local agricultural producers as educators and encouragers to surrounding agricultural stakeholders. This approach has resulted in a 193% increase in cost-share allocations over recent years with 67 agricultural BMPs implemented across the Little River Watershed from 2002 through 2004.

The Little River Watershed was the Tennessee Growth Readiness Program (TGRP) pilot community; a statewide program built on existing best practices from the Non-point Education for Municipal Officials (NEMO) program, and the Center for Watershed Protection. TGRP will facilitate transferring results to communities statewide. Linkages between the Tennessee program and the National NEMO Network will provide a conduit for transfer of project results throughout the United States. Initiative results will be posted on the Watershed Assistance Network internet site and presentations will be made at two regional or national conferences such as the National Conference on Grazing Lands, the Southeast Watershed Forum Annual Conference, or the National Association of Conservation Districts Annual Meeting.

EXPERIENCE IN GRANT MANAGEMENT

The Blount County Soil Conservation District will be the project lead and fiscal agent for this cooperative initiative, if approved for the TWGP. The BCSCD has planned, coordinated activities, implemented projects, and managed grant funding from multiple federal, state, and foundation programs including: the Nonpoint Source Program, Tennessee Department of Agriculture, Tennessee Valley Authority, U.S. Fish and Wildlife Service, National Fish and Wildlife Foundation, Smoky Mountain Resource Conservation and Development, and the Tennessee Wildlife Resources Agency. Additionally, the BCSCD along with the Natural Resources Conservation Service has administered numerous federal conservation programs such as the Environmental Quality Incentive Program, Wildlife Habitat Incentive Program, Grasslands Reserve Program, Conservation reserve Program, Tree Assistance Program, and Agricultural Conservation Program. It is anticipated that federal dollars will be allocated for the Conservation Security Program in order to provide funding for maintenance of implemented BMP's.

Table 1. BUDGET INFORMATION - EPA Watershed Initiative Grant Program[1]

SECTION A - BUDGET SUMMARY			
Watershed Project, Activity or Work Plan Element	Federal	Non-Federal	Total
1. Monitoring and Assessment	$ 46,000	$ 93,500	$ 139,500
2. Septic Tank Retrofit and Repair	$ 150,000	$ 71,500	$ 221,500
3 Watershed Education and Homeowner Outreach	$ 90,500	$ 84,500	$ 175,000
4. Agricultural Best Management Practices	$ 613,500	$ 477,200	$1,090,700
Totals	$ 900,000	$ 726,700	$1,626,700

SECTION B - BUDGET CATEGORIES					
	Watershed Project, Activity or Work Plan Element				Total
Budget Categories	(1)	(2)	(3)	(4)	
a. Personnel	$ 65,000	$ 20,000	$ 67,500	$ 151,200	$ 303,700
b. Fringe Benefits	-	-	-	-	-
c. Travel	$ 2000	$ 1500	$ 1500	$ 1500	$ 6500
d. Equipment					
e. Supplies	$ 14,000	$ 100,000	$ 23,000	$ 375,200	$ 512,200
f. Contractual	$ 58,500	$ 100,000	$ 23,000	$ 562,800	$ 744,300
g. Construction					
h. Other (Educational Materials)			$ 60,000		$ 60,000
i. Total Direct Charges (sum line a-h)	$ 139,500	$ 221,500	$ 175,000	$1,090,700	$1,626,700
j. Indirect Charges					
TOTALS (sum line i-j)	$ 139,500	$ 221,500	$ 175,000	$1,090,700	$1,626,700

[1] Excerpted from Standard Form 424A, OMB Circular A-102